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# मानक

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IS 9175-33 (1988): Rationalized Steels for Automobile and Ancillary Industry, Mechanical and Physical Properties - Part 33 42Cr6V10 Grade steel [MTD 16: Alloy Steels and Forgings]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*

**SPECIFICATION FOR  
RATIONALIZED STEELS FOR THE AUTOMOBILE  
AND ANCILLARY INDUSTRY**

**PART 33 MECHANICAL AND PHYSICAL PROPERTIES  
OF 42Cr6V10 GRADE STEEL**

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## Indian Standard

# SPECIFICATION FOR RATIONALIZED STEELS FOR THE AUTOMOBILE AND ANCILLARY INDUSTRY

### PART 33 MECHANICAL AND PHYSICAL PROPERTIES OF 42Cr6V10 GRADE STEEL

## 0. FOREWORD

**0.1** This Indian Standard ( Part 33 ) was adopted by the Bureau of Indian Standards on 5 May 1988, after the draft finalized by the Coordinating Committee on Materials for Automobiles Sectional Committee had been approved by the Structural and Metals Division Council.

**0.2** Part 1 of this standard was published in 1979 which covers the chemical composition of 33 rationalized steels. The mechanical properties, hardenability and isothermal transformation characteristics of these 33 rationalized steels are being covered in different parts of this standard ( Parts 2 to 34 ).

## 1. SCOPE

**1.1** This standard covers the chemical composition, mechanical properties, hardenability and isothermal transformation characteristics of 42Cr6V10 grade of steel for use by the automobile and ancillary industry.

## 2. CHEMICAL COMPOSITION

**2.1** The chemical composition of this grade of steel shall be as given below:

Constituent, Percent			
C	Si	Mn	
0.38-0.46	0.15-0.35	0.50-0.80	
Constituent, Percent			
Cr	V	S	P
1.40-1.70	0.07-0.12	0.035, Max	0.035, Max

## 3. HARDNESS

**3.1** The maximum hardness for this grade of steel delivered in the annealed condition when determined in accordance with IS : 1500-1983\* shall be 235 HB.

## 4. MECHANICAL PROPERTIES

**4.1** The mechanical properties of this grade of steel in the hardened and tempered condition when determined in accordance with IS : 1598-1960† and IS : 1608-1972‡ shall be as given in Table 1.

\*Method for Brinell hardness test for steel ( first revision ).

†Method for Izod impact test of metals ( first revision ).

‡Method for tensile testing of steel products ( first revision ).

**TABLE 1 MECHANICAL PROPERTIES OF  
42Cr6V10 GRADE STEEL**

( Clauses 4.1 and 4.2 )

LIMITING AND RULING SECTION	TENSILE STRENGTH	0.2 PER- CENT PROOF STRESS, Min	ELON- GATION PER- CENT, Min on	IZOD IMPACT, Min	HARD- NESS
mm	MPa	MPa	5.65√S <sub>0</sub>	J	BHN
(1)	(2)	(3)	(4)	(5)	(6)
100	600-800	400	13	40	180-234
63	750-950	550	12	30	223-277
30	850-1050	650	10	30	248-302

**4.2** The media of quenching is oil to attain the properties as specified in Table 1.

## 5. HOT WORKING AND HEAT TREATMENT TEMPERATURES

**5.1** The hot working and hot treatment temperatures are as under:

Forging rolling temperature	1 200°C, Max
Normalizing temperature	840/880°C
Subcritical annealing temperature	680/720°C
Hardening temperature	820/860°C
Tempering temperature	670°C, Max

## 6. TRANSFORMATION CHARACTERISTICS

**6.1** The isothermal transformation diagram for this grade of steel is given in Fig. 1.

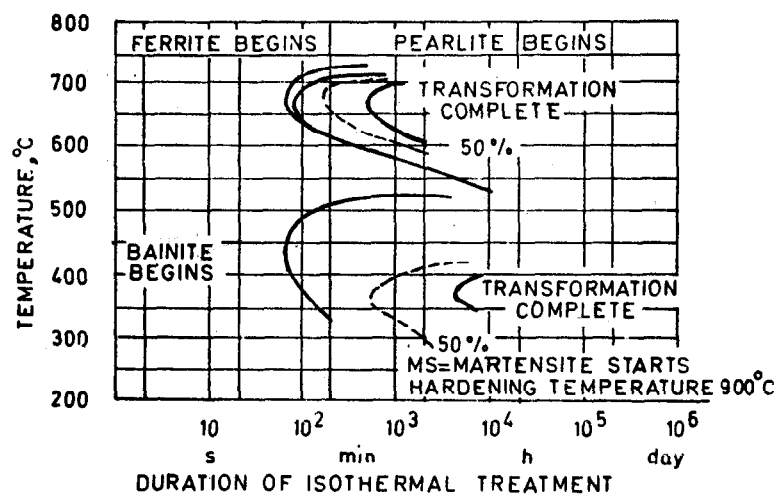


FIG. 1 Isothermal Transformation Curves for the Grade 42Cr6V10